

NODE=B105

 **$\Xi(1690)$**  $I(J^P) = \frac{1}{2}(?)$  Status: \*\*\*

AUBERT 08AK, in a study of  $\Lambda_c^+ \rightarrow \Xi^- \pi^+ K^+$ , finds some evidence that the  $\Xi(1690)$  has  $J^P = 1/2^-$ .

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DIONISI 78 sees a threshold enhancement in both the neutral and negatively charged  $\Sigma\bar{K}$  mass spectra in  $K^- p \rightarrow (\Sigma\bar{K})K\pi$  at 4.2 GeV/c. The data from the  $\Sigma\bar{K}$  channels alone cannot distinguish between a resonance and a large scattering length. Weaker evidence at the same mass is seen in the corresponding  $\Lambda\bar{K}$  channels, and a coupled-channel analysis yields results consistent with a new  $\Xi$ .

BIAGI 81 sees an enhancement at 1700 MeV in the diffractively produced  $\Lambda K^-$  system. A peak is also observed in the  $\Lambda\bar{K}^0$  mass spectrum at 1660 MeV that is consistent with a 1720 MeV resonance decaying to  $\Sigma^0\bar{K}^0$ , with the  $\gamma$  from the  $\Sigma^0$  decay not detected.

BIAGI 87 provides further confirmation of this state in diffractive dissociation of  $\Xi^-$  into  $\Lambda K^-$ . The significance claimed is 6.7 standard deviations.

ADAMOVICH 98 sees a peak of  $1400 \pm 300$  events in the  $\Xi^- \pi^+$  spectrum produced by 345 GeV/c  $\Sigma^-$ -nucleus interactions.

 **$\Xi(1690)$  MASSES****MIXED CHARGES**VALUE (MeV)DOCUMENT ID

**1690±10 OUR ESTIMATE** This is only an educated guess; the error given is larger than the error on the average of the published values.

NODE=B105205

 **$\Xi(1690)^0$  MASS**

<u>VALUE (MeV)</u>	<u>EVTS</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
1686±4	1400	ADAMOVICH	98	$\Sigma^-$ nucleus, 345 GeV/c
1699±5	175	<sup>1</sup> DIONISI	78	$K^- p$ 4.2 GeV/c
1684±5	183	<sup>2</sup> DIONISI	78	$K^- p$ 4.2 GeV/c

NODE=B105M0

NODE=B105M0

→ UNCHECKED ←

 **$\Xi(1690)^-$  MASS**

<u>VALUE (MeV)</u>	<u>EVTS</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
1691.1± 1.9±2.0	104	BIAGI	87	$\Xi^-$ Be 116 GeV
1700 ±10	150	<sup>3</sup> BIAGI	81	$\Xi^-$ H 100, 135 GeV
1694 ± 6	45	<sup>4</sup> DIONISI	78	$K^- p$ 4.2 GeV/c

NODE=B105M-

NODE=B105M-

OCCUR=2

 **$\Xi(1690)$  WIDTHS****MIXED CHARGES**VALUE (MeV)DOCUMENT ID**<30 OUR ESTIMATE**

NODE=B105210

NODE=B105W

NODE=B105W

→ UNCHECKED ←

 **$\Xi(1690)^0$  WIDTH**

<u>VALUE (MeV)</u>	<u>EVTS</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
10± 6	1400	ADAMOVICH	98	$\Sigma^-$ nucleus, 345 GeV/c
44±23	175	<sup>1</sup> DIONISI	78	$K^- p$ 4.2 GeV/c
20± 4	183	<sup>2</sup> DIONISI	78	$K^- p$ 4.2 GeV/c

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NODE=B105W0

OCCUR=2

 **$\Xi(1690)^-$  WIDTH**

<u>VALUE (MeV)</u>	<u>CL%</u>	<u>EVTS</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
< 8	90	104	BIAGI	87	$\Xi^-$ Be 116 GeV
47±14		150	<sup>3</sup> BIAGI	81	$\Xi^-$ H 100, 135 GeV
26± 6		45	<sup>4</sup> DIONISI	78	$K^- p$ 4.2 GeV/c

NODE=B105W-

NODE=B105W-

**$\Xi(1690)$  DECAY MODES**

Mode	Fraction ( $\Gamma_i/\Gamma$ )
$\Gamma_1 \Lambda\bar{K}$	seen
$\Gamma_2 \Sigma\bar{K}$	seen
$\Gamma_3 \Xi\pi$	seen
$\Gamma_4 \Xi^-\pi^+\pi^0$	
$\Gamma_5 \Xi^-\pi^+\pi^-$	possibly seen
$\Gamma_6 \Xi(1530)\pi$	

 **$\Xi(1690)$  BRANCHING RATIOS**

$\Gamma(\Lambda\bar{K})/\Gamma_{\text{total}}$	$\Gamma_1/\Gamma$				
VALUE	EVTS	DOCUMENT ID	TECN	CHG	COMMENT
seen	104	BIAGI	87	SPEC	$\Xi^-$ Be 116 GeV

$\Gamma(\Sigma\bar{K})/\Gamma(\Lambda\bar{K})$	$\Gamma_2/\Gamma_1$				
VALUE	EVTS	DOCUMENT ID	TECN	CHG	COMMENT
$0.75 \pm 0.39$	75	ABE	02C	BELL	$e^+e^- \approx \mathcal{T}(4S)$
$2.7 \pm 0.9$		DIONISI	78	HBC	$K^- p$ 4.2 GeV/c
$3.1 \pm 1.4$		DIONISI	78	HBC	$K^- p$ 4.2 GeV/c

$\Gamma(\Xi\pi)/\Gamma(\Sigma\bar{K})$	$\Gamma_3/\Gamma_2$			
VALUE	DOCUMENT ID	TECN	CHG	COMMENT
<0.09	DIONISI	78	HBC	$K^- p$ 4.2 GeV/c

$\Gamma(\Xi\pi)/\Gamma_{\text{total}}$	$\Gamma_3/\Gamma$			
VALUE	DOCUMENT ID	TECN	COMMENT	
seen	ADAMOVICH	98	WA89	$\Sigma^-$ nucleus, 345 GeV/c

$\Gamma(\Xi^-\pi^+\pi^0)/\Gamma(\Sigma\bar{K})$	$\Gamma_4/\Gamma_2$			
VALUE	DOCUMENT ID	TECN	CHG	COMMENT
<0.04	DIONISI	78	HBC	$K^- p$ 4.2 GeV/c

$\Gamma(\Xi^-\pi^+\pi^-)/\Gamma_{\text{total}}$	$\Gamma_5/\Gamma$			
VALUE	DOCUMENT ID	TECN	CHG	COMMENT
possibly seen	BIAGI	87	SPEC	$\Xi^-$ Be 116 GeV

$\Gamma(\Xi^-\pi^+\pi^-)/\Gamma(\Sigma\bar{K})$	$\Gamma_5/\Gamma_2$			
VALUE	DOCUMENT ID	TECN	CHG	COMMENT
<0.03	DIONISI	78	HBC	$K^- p$ 4.2 GeV/c

$\Gamma(\Xi(1530)\pi)/\Gamma(\Sigma\bar{K})$	$\Gamma_6/\Gamma_2$			
VALUE	DOCUMENT ID	TECN	CHG	COMMENT
<0.06	DIONISI	78	HBC	$K^- p$ 4.2 GeV/c

 **$\Xi(1690)$  FOOTNOTES**

<sup>1</sup> From a fit to the  $\Sigma^+ K^-$  spectrum.

<sup>2</sup> From a coupled-channel analysis of the  $\Sigma^+ K^-$  and  $\Lambda\bar{K}^0$  spectra.

<sup>3</sup> A fit to the inclusive spectrum from  $\Xi^- N \rightarrow \Lambda K^- X$ .

<sup>4</sup> From a coupled-channel analysis of the  $\Sigma^0 K^-$  and  $\Lambda K^-$  spectra.

 **$\Xi(1690)$  REFERENCES**

AUBERT	08AK	PR D78 034008	B. Aubert <i>et al.</i>	(BABAR Collab.)
ABE	02C	PL B524 33	K. Abe <i>et al.</i>	(KEK BELLE Collab.)
ADAMOVICH	98	EPJ C5 621	M.I. Adamovich <i>et al.</i>	(CERN WA89 Collab.)
BIAGI	87	ZPHY C34 15	S.F. Biagi <i>et al.</i>	(BRIS, CERN, GEVA+) I
BIAGI	81	ZPHY C9 305	S.F. Biagi <i>et al.</i>	(BRIS, CAVE, GEVA+) II
DIONISI	78	PL 80B 145	C. Dionisi <i>et al.</i>	(CERN, AMST, NIJM+) I

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DESIG=3;OUR EST  
DESIG=5  
DESIG=6  
DESIG=4

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NODE=B105R6

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OCCUR=2

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